# Aman Chokshi


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ADS Publication List
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## Education

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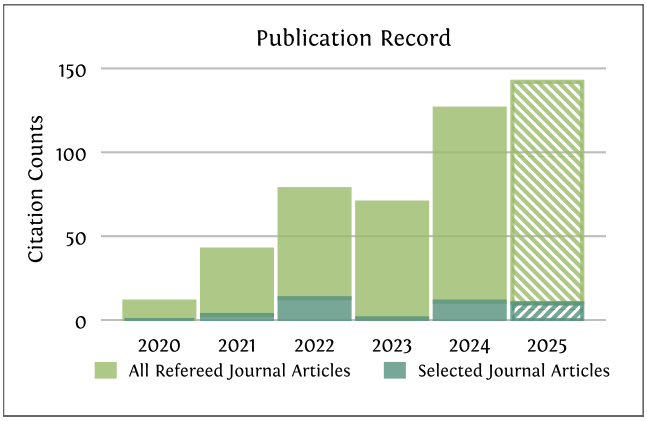
|---|---|---|
| 2019 – 2025 | **Doctor of Philosophy in Astrophysics**<br>**Thesis**: *Unveiling Cosmic Reionisation: Improvements in Understanding Interferometric Systematics*<br>**Advisors**: Rachel Webster, Bart Pindor, Nichole Barry | University of Melbourne |
| June 2018 | **Master of Science in Physics** *(Distinction)* | Pondicherry University |
| June 2015 | **Bachelor of Science in Physics** *(Exemplary)* | Loyola College |

## Research Topics & Skills

- Observational Cosmology, Radio Astronomy, Widefield Interferometry, Epoch of Reionization
- Murchison Widefield Array (MWA), Square Kilometre Array (SKA), South Pole Telescope (SPT)
- Fourier Methods, Power Spectrum Analysis, Bayesian Inference, Cosmological Simulation
- Instrumental Simulations, Foreground Characterization, Calibration, Satellite Dynamics
- High-Performance Computing, Software Development, System Administration
- Cryogenics, In-situ Electronic Testing, Machining, Observatory Operations

## Quick Statistics

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|---|---|
| First or second author | 5 (38 citations[1]) |
| Contributing author | 19 (469 citations[1]) |
| *h*-index, *i10*-index | 9, 9[1] |
| Invited, contributed talks | 7, 18 |
| International collaboration | 70% of papers[2] |
| Research collaborations | MWA, SPT, EHT, A3D |
| Published media | NASA, NSF, ESA |

[1] Accessed from NASA ADS, June, 2025
[2] Accessed from Scival, June, 2025

## Research Experience

2025-2027 Montreal Canada
*Trottier Space Institute Postdoctoral Fellow*
**Bridging the Telescope-Theory Divide in Pursuit of the First Light**
Exploration of how complex instrumental characteristics can couple with dominant foregrounds to prevent a detection, and bias recovered cosmology. Measure instruments, model systematics and propagate effects to cosmological simulators.

2023-2025 Melbourne Australia
*PhD at the University of Melbourne [Resumed]*
**Interferometric Effects of Deformed Beams: Epoch of Reionisation Power Spectra**
Demonstrate foreground spectral leakage into sensitive measurement modes by factors exceeding $\geq$100 in the presence of deformed beam.[Chokshi et al. 2024]
**Advisors**: Rachel Webster, Nichole Barry

2021-2022 South Pole Antarctica
*Winterover at South Pole Telescope [Leave of Absence from PhD]*
**Detection of Thermal Emission from Low-Earth Satellites at Millimeter Wavelengths**
Explore the impact of satellite mega-constellations on pristine South Pole millimeter-skies, using the South Pole Telescope.[A. Foster, **A. Chokshi**, et al. 2024]
**PIs**: John Carlstrom, Brad Benson

2019-2021 Melbourne
*PhD at the University of Melbourne*
**Satellite Measurements of MWA Beams**
Dual-polarized in-situ satellite measurements of 14 MWA beam-patterns, critical to Epoch of Reionisation science. [Chokshi et al. 2021b, 2021a; 15, 4 citations]
**Advisors**: Rachel Webster, Nichole Barry, Bart Pindor

## Field Experience

2025 **Arctic deployment of ALBATROS Telescope Array**
Led a team of 3 graduate students to the McGill Arctic Research Station ($79°N$), to build and deploy two new ALBATROS stations in the High Canadian Arctic.

2021-2022 **South Pole Telescope Winterover**
Responsible for the operation and maintenance of the South Pole Telescope. Limited access to internet, limited resources, high altitude (10,000+ ft), and temperatures which can drop below -70C. Monitor data quality in real-time, problem solve any hardware or software issues, generate reports and communicate with telescope PIs.

2020 **Duty Astronomer at the Australia Telescope Compact Array**
Ensure the safety of the ATCA array for a week, preliminary data checks, monitor the weather, and assist observers. Conducted remotely due to COVID-19.

2019-2020 **Design, Deploy, and Repair Satellite Beam Measurement Experiment at MWA**
Deployed a satellite calibration system at the Murchison Radio-astronomy Observatory (MRO), including the design and installation of reference antennas and integration into MWA receivers. Returned in 2020 to repair lightning damage and resume beam measurements critical to EoR science.

2018 **Assist in Setup of SARAS 2 in the Himalayas**
Helped deploy the SARAS 2 (Shaped Antenna measurement of the background RAdio Spectrum) global 21cm experiment in a remote Himalayan high altitude desert.

2018 **Testing of the 0.7m GROWTH Telescope at the Indian Astronomical Observatory**
Spent a week testing the GROWTH Robotic telescope at the Indian Astronomical Observatory (IAO), Hanle, to obtain some of the first commissioning images.

2017 **Solar Spectroscopy at the Kodaikanal Solar Observatory (KSO)**
Observed and analysed solar spectroscopic data with the Kodaikanal Tunnel Telescope.

2015 **Antenna Characterization at the Gauribidanur Radio Observatory**
Directional and frequency characterization of a disk-cone antenna for CMB expt. developed by the Raman Research Institute, at their Gauribidanur radio-quiet site.

## Grants, Awards, Scholarships & Prizes

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|---|---|---|
| 2025 | Nature #ScientistAtWork Winner | 600 GBP |
| 2024 | Trottier Space Institute Fellowship, McGill University | 68,000 CAD/yr |
| 2024 | Dunlap Fellowship, University of Toronto[†] | 80,000 CAD/yr |
| 2024 | Show Us Your Science, University of Melbourne — First Prize | 500 AUD |
| 2023 | MWA Decadal Meeting — Best Poster (Runner-up) | |
| 2022 | Antarctic Service Medal (NSF & USAP) | |
| 2021 | Laby Travelling Scholarship — deferred (COVID-19) | 10,000 AUD |
| 2021 | ASA Student Challenge — Runner-up | 200 AUD |
| 2020 | MWA Project Meeting — Best Presentation (Runner-up) | |
| 2019–2024 | CSIRO Astronomy & Space Sci. Student Program Travel Grant | 5,000 AUD/yr |
| 2019–2024 | Melbourne Research Scholarship | 31,200 AUD/yr |
| 2019 | Australian Govt. RTP Fee Offset | 175,991 AUD |
| 2018 | Pondicherry University Physics Scholarship | 20,000 INR |

[†] Declined in favour of TSI Fellowship

## Teaching Experience

2023-2024 Masters project advising at the University of Melbourne - Jiayi Li
Infrared interferometry with VLTI. 100 hours over 6 months

2019-2021 Undergraduate Lab Demonstrator at the University of Melbourne
Solar System to the Cosmos. 64 hours over 16 weeks

2020 Python tutor at the Kathmandu Astrophysics School
45 hours over 9 weeks

2019-2021 Telescopes in Schools Volunteer; Victoria, Australia
Teacher training & student outreach

## Selected Talks

### Invited

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|---|---|---|
| June 2025 | EoR Challenges in a pre-SKA Era | Uni. Western Cape |
| June 2024 | Interferometric Challenges of an EoR Detection | CSIRO & ASA |
| May 2024 | Instrumental Challenges of an EoR Detection | ACAMAR10, Guangzhou |
| 2023 | Auroras & Astronomy: A Year at the South Pole x 3 | Uni. Melbourne, CSIRO, RRI |
| 2021 | Satellite Measurements of MWA Beampatterns | Macquarie Uni. |

### Contributed

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|---|---|---|
| June 2025 | Unveiling the Cosmic Savannah: Taming Wild Beams | Cosmo Safari |
| July 2024 | Necessity of Validated Beam Models for the EoR | SKA CD/EoR Meeting |
| July 2024 | Towards and EoR Detection: Challenges in a pre-SKA Era | ASA ASM |
| May 2024 | Instrumental Challenges of an EoR Detection | ASTRO3D |
| Mar 2024 | Stations as Unique as Snowflakes: Consequences to EoR | Cosmology in the Alps |
| Feb 2024 | Instrumental Challenges of an EoR Detection | University of Nagoya |
| Sept 2021 | Implications of Beam Models on Epoch of Reionisation | ASTRO3D |
| July 2021 | Calibrating Radio Telescopes with Satellites | Australian Math Science Inst |
| July 2020 | Dual polarization MWA beam-patterns using satellites | MWA Project Meeting |
| Sept 2019 | MWA Beam Measurements with Satellites | Drone & Satellite Workshop |
| May 2017 | H$\alpha$ Spectroscopy of Solar Prominences | Indian Inst. of Astrophysics |

## Media, Photography & Personal Projects

2025 ▪ Winner of Nature #ScientistAtWork Competition

2024 ▪ ABC Breakfast News, Devil's Comet (aka 12P/Pons-Brooks)

2022 ▪ Spaghettification EP12: Go South, Skies Are Clearer There
▪ F-Stop Collaborate EP 267: Aman Chokshi Photography from the South Pole
▪ Space.com: South Pole's never-ending night and daily auroras

2020 ▪ ASTRO3D in the Home YouTube Series: Explore the Night Sky & Backyard Astronomy

2019-2022 NASA Astronomy Picture of the Day [APOD]
▪ Little Planet South Pole: Auroras at Dawn
▪ South Pole Lunar Eclipse and Auroras over the South Pole Telescope
▪ South Pole Solar Eclipse over the South Pole Telescope
▪ Triangulum Galaxy and Meteor Train

2018 Arduino Star Tracker
Designed and built a portable star tracker with an Arduino and Laser cut mechanical components. Enabled long exposures of deep sky objects without stars trailing. [report]

2012 Low Cost Wheelchair for India
Designed and built a light, low-cost wheelchair over 3 months with a ∼200 AUD budget. Presented the design to the state government for further development. [report]

## Selected Publications †

† 1. *Dual Polarization Measurements of MWA Beampatterns at 137 MHz*
**A. Chokshi**, J. L. B. Line, N. Barry, D. Ung, D. Kenney, A. McPhail, A. Williams, R. L. Webster
[ 15 citations ] 2021, Monthly Notices of the Royal Astronomical Society, 502, 2

† 2. *EMBERS: Experimental Measurement of BEam Responses with Satellites*
**A. Chokshi**, J. L. b. Line and B. McKinley
[ 4 citations ] 2021, Journal of Open Source Software, 5, 55

† 3. The Role of the Instrumental Response in 21 cm Epoch of Reionization Power Spectrum Gridding Analyses
N. Barry, **A. Chokshi**
[ 12 citations ] 2022, The Astrophysical Journal, 929, 1

† 4. Necessity of individually validated beam models for an interferometric epoch of reionization detection
**A. Chokshi** N. Barry, J. L. B. Line, C. H. Jordan, B. Pindor, R. L. Webster
[ 7 citations ] 2024, Monthly Notices of the Royal Astronomical Society, 534, 3

† 5. Detection of Thermal Emission at Millimeter Wavelengths from Low-Earth Orbit Satellites
A. Foster, **A. Chokshi** ... +SPT Collaboration
2025, astro.theoj 137526

## Other Publications

6. *Deep multiredshift limits on Epoch of Reionization 21 cm power spectra from four seasons of MWA observations*
C. M. Trott, C. H. Jordan, ... **A. Chokshi**, ... et al. [36 authors]
[ 211 citations ] 2020, Monthly Notices of the Royal Astronomical Society, 493, 4

7. *The impact of tandem redundant/sky-based calibration in MWA Phase II data analysis*
Z. Zheng, J. C. Pober, ... **A. Chokshi**, ... et al. [30 authors]
[ 11 citations ] 2020, Publications of the Astronomical Society of Australia, 37

† 8. *A new MWA limit on the 21 cm power spectrum at redshifts 13-17*
S. Yoshiura, B. Pindor, ... **A. Chokshi** ... et al. [32 authors]
[ 54 citations ] 2021, Monthly Notices of the Royal Astronomical Society, 505, 4

9. *Constraining the 21 cm brightness temperature of the IGM at z=6.6 around LAEs with the MWA*
C. M. Trott, C. H. Jordan, ... **A. Chokshi** ... et al. [32 authors]
[ 4 citations ] 2021, Monthly Notices of the Royal Astronomical Society, 507, 1

† 10. *Epoch of reionization power spectrum limits from Murchison Widefield Array data targeted at EoR1 field*
M. Rahimi, B. Pindor, ... **A. Chokshi** ... et al. [31 authors]
[ 26 citations ] 2021, Monthly Notices of the Royal Astronomical Society, 508, 4

† 11. *Radio fossils, relics, and haloes in Abell 3266: cluster archaeology with ASKAP-EMU and the ATCA*
C. J. Riseley,E. Bonnassieux, T. Vernstrom, T. J. Galvin, **A. Chokshi** ... et al [24 authors]
[ 37 citations ] 2022, Monthly Notices of the Royal Astronomical Society, 515, 2

12. *Testing the ΛCDM Cosmological Model with Forthcoming Measurements of the CMB with SPT-3G*
K. Prabhu, S. Raghunathan, ..., **A. Chokshi** ... +SPT Collaboration
[ 33 citations ] 2024, ApJ 973 4

† 13. *MOSEL Survey: Spatially Offset LyC Emission at z=3.088 & Low Number Density of Observed LyC Leakers*
A, Gupta, C. M. Trott, ..., **A. Chokshi**
[ 8 citations ] 2024, ApJ 973 169

14. *First Use of GPS Satellites for Beam Calibration of Radio Telescopes*
S. Berger, A. Lasinski, E. Egan, D. Wulf, **A. Chokshi** J, Sievers
2024, Arxiv 2411.06144

15. *Pointing Accuracy Improvements for the South Pole Telescope with Machine Learning*
P. M. Chichura, A. Rahlin, ..., **A. Chokshi** ... +SPT Collaboration
[ 1 citations ] 2024, Arxiv 2412.15167

16. *Measurement and Modeling of Polarized Atmosphere at the South Pole with SPT-3G*
A. Coerver, J. A. Zebrowski, ..., **A. Chokshi** ... +SPT Collaboration
[ 7 citations ] 2025, ApJ 982 15

17. *The SPT-Deep Cluster Catalog: Sunyaev-Zel'dovich Selected Clusters from Combined SPT-3G and SPTpol Measurements over 100 Square Degrees*
K. Kornoelje, L. E. Bleem, ..., **A. Chokshi** ... +SPT Collaboration
[ 4 citations ] 2025, Arxiv 2503.17271

18. *Cosmology From CMB Lensing and Delensed EE Power Spectra Using 2019-2020 SPT-3G Polarization Data*
F. Ge, M. Millea, ..., **A. Chokshi** ... +SPT Collaboration
[ 33 citations ] 2025, PRD 111, 083534

19. *Unified and consistent structure growth measurements from joint ACT, SPT and Planck CMB lensing*
F. J. Qu, F. Ge, ..., **A. Chokshi** ... +SPT Collaboration
[ 2 citations ] 2025, Arxiv 2504.20038